US006060064A

United States Patent [19]

Adams et al.

[11] Patent Number: 6,060,064

[45] Date of Patent: May 9, 2000

[54] **CHIMERIC VIRUS-LIKE PARTICLE ANTIGEN PRESENTATION AND DELIVERY SYSTEM**

[75] Inventors: **Sally Elizabeth Adams**, Oxford; **Nigel Robert Burns**, Abingdon; **Simon Mark Richardson**, Oxford, all of United Kingdom

[73] Assignee: **British Biotech Pharmaceuticals Limited**, Oxford, United Kingdom

[21] Appl. No.: **08/492,076**

[22] PCT Filed: **Dec. 24, 1993**

[86] PCT No.: **PCT/GB93/02656**

§ 371 Date: **Jun. 28, 1995**

§ 102(e) Date: **Jun. 28, 1995**

[87] PCT Pub. No.: **WO94/14969**

PCT Pub. Date: **Jul. 7, 1994**

[30] **Foreign Application Priority Data**

Dec. 29, 1992 [GB] United Kingdom 9227068

[51] **Int. Cl.**[7] **A61K 39/12**

[52] **U.S. Cl.** **424/199.1**; 435/69.1

[58] **Field of Search** 435/172.3, 235.1, 435/236, 320.1; 424/199.1, 207.1

[56] **References Cited**

PUBLICATIONS

Adams et al., 1987 Nature 329:68–70.

Griffiths et al., 1991 J. Virol. 65:450–456.

Harris et al., 1992 Immunol. 77:315–321.

Reeck et al., 1987 Cell 50:667.

Lewin, 1987 Science 237:1570.

Primary Examiner—Laurie Scheiner
Assistant Examiner—Jeffrey S. Parkin
Attorney, Agent, or Firm—Banner & Witcoff, Ltd.

[57] **ABSTRACT**

Chimeric virus-like particles produced by a non-natural particle-forming protein. The non-natural particle forming protein comprises a self-assembling particle-forming first amino acid sequence substantially homologous with a yeast retrotransposon Ty p1 protein and a second amino acid sequence. The second sequence is antigenic and is incorporated within an epitope of the first amino acid sequence, which epitope, on particles formed from the first amino-acid sequence alone, is surface exposed. Particles formed from such proteins are immunogenic and can be used in immunotherapeutic or prophylactic vaccines or as diagnostic agents.

25 Claims, 8 Drawing Sheets